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(54) **Knitting method of knitted fabric and knitted fabric**

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Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a knitting method of a knitted fabric including a projecting knitted structure formed by bringing two stitches adjacent in a knitting width direction closer in a direction of approaching each other to project out of a surface of the knitted fabric, and a knitted fabric obtained by the knitting method. In particular, the present invention relates to a knitting method of a knitted fabric in which the appearance differs between a case in which the knitted fabric is seen from the left side and a case in which the knitted fabric is seen from the right side by having a knitting yarn configuring one stitch in the projecting knitted structure and a knitting yarn configuring the other stitch as different types of knitting yarns, and a knitted fabric obtained by the knitting method.

Description of the Related Art

[0002] For example, patent document 1 discloses a technique of knitting Afghan knitted fabric in which hue changes in a complex manner depending on the viewing angle by forming a low region section lowered in a recessed form and a high region section raised in a projecting form on the surface of the Afghan knitted fabric, using different colors between the low region section and the high region section, by hand knitting using crochet hook. The change in hue occurs when the low region section appears and disappears depending on the angle of viewing the Afghan knitted fabric.

PRIOR ART DOCUMENT

PATENT DOCUMENT

[0003] [Patent Document 1] Japanese Utility Model Publication No. 3159219 Prior Art document EP 0 822 280 A2 and GB 524 698 A disclose knitting methods for knitting a knitted fabric using a flat knitting machine including at least a pair of a front and a back needle bed and in which one of the front and back needle beds is capable of being racked in a traverse direction, the knitting methods of the knitted fabric comprising a state in which a first stitch and a second stitch are held in order toward a right side on one needle bed and a third stitch is held at a position between the first stitch and the second stitch on the other needle bed, and involving rib knitting a colour patterned fabric. From document FR 2 571 387 A1 a knitting method of a knitted fabric is known, wherein the structure of the fabric comprises successive groups of rows with purl stitches which are each separated from each other by one row of plain stitches, wherein the groups of rows with purl stitches are forming on the struc-

ture of the fabric a plurality of tubular projections extending coursewise and yielding a different visual appearance of the fabric dependent on the viewing angle with respect to the coursewise direction in the fabric, this knitting method using a flat knitting machine including at least a front and back needle bed.

SUMMARY OF THE INVENTION

[0004] However, a technique of knitting a knitted fabric in which the appearance differs depending on the viewing angle using a flat knitting machine is not currently proposed. The inventors of the present invention considered a knitting method of a knitted fabric to knit a projecting knitted structure formed by bringing two stitches adjacent in a knitting width direction closer in a direction of approaching each other to project out of a surface of the knitted fabric. It was believed that, if the projecting knitted structure could be knitted in the knitted fabric, a knitted fabric that appears differently when seen from the left and when seen from the right should be obtained by having the knitting yarn configuring one stitch in the projecting knitted structure and the knitting yarn configuring the other stitch as different types.

[0005] In light of the foregoing, it is an object of the present invention to provide a knitting method of a knitted fabric for knitting a projecting knitted structure formed by bringing two stitches adjacent in a knitting width direction closer in a direction approaching each other to project out of the surface side of the knitted fabric.

[0006] This and other objects are solved by a knitting method having the features and steps, respectively, as set forth in claim 1. The objects are also solved by a knitting method in accordance with claim 2. Preferred embodiments of the knitting methods are stated in the subclaims 3 and 4. With a knitted fabric defined in claim 5 the objects are also met.

[0007] The present invention is a knitting method of a knitted fabric for knitting a knitted fabric using a flat knitting machine including at least a pair of a front and a back needle bed and in which one of the front and back needle beds is capable of being racked in a traverse direction. The knitting method of the knitted fabric of the present invention performs steps α and β from a state in which a stitch A_0 and a stitch Z_0 are held in order toward a right side on one of the needle beds and a stitch P_0 is held at a position between the stitch A_0 and the stitch Z_0 on the other needle bed.

[step α]... obtaining a state in which the position of the stitch P_0 is on a left side of the stitch A_0 , and continuously performing knitting of a new stitch A_1 following the stitch A_0 and knitting of a new stitch P_1 following the stitch P_0 . The stitch P_1 may be a tuck stitch.

[step β]... obtaining a state in which a position of the stitch P_1 is on a right side of the stitch Z_0 and continuously performing knitting of a new stitch Z_1 fol-

lowing the stitch Z_0 and knitting of a new stitch P_2 following the stitch P_1 . The stitch P_2 may be a tuck stitch.

[0008] The step α and the step β are performed to bring the stitch A_1 and the stitch Z_1 closer in a direction of approaching each other in a knitting width direction to form a projecting knitted structure raised in a projecting form in a thickness direction of the knitted fabric.

[0009] The step α and the step β are interchangeable, and when performing the step β first, the stitch P_1 and the stitch P_2 in the step β are replaced with the stitch P_0 and the stitch P_1 , and the stitch P_0 and the stitch P_1 in the step α are replaced with the stitch P_1 and the stitch P_2 (see description below).

[step β]... obtaining a state in which a position of the stitch P_0 is on a right side of the stitch Z_0 and continuously performing knitting of a new stitch Z_1 following the stitch Z_0 and knitting of a new stitch P_1 following the stitch P_0 .

[step α]... obtaining a state in which the position of the stitch P_1 is on a left side of the stitch A_0 , and continuously performing knitting of a new stitch A_1 following the stitch A_0 and knitting of a new stitch P_2 following the stitch P_1 .

[0010] According to one aspect of the knitting method of the knitted fabric of the present invention, the step α and the step β are performed from a state in which two or more units, each unit having the stitch A_0 and the stitch Z_0 held on one needle bed and the stitch P_0 and a stitch Q_0 held on the other needle bed as one unit, are lined in the knitting width direction, and the stitch Q_0 is at a position on a right side of the stitch P_0 and on the left side of the stitch Z_0 . In this case, in the step β , the stitch Q_0 is positioned on the right side of the stitch Z_0 and the stitch P_2 is newly knitted following the stitch Q_0 (in this configuration, the stitches are not replaced even if the step β is performed first; see second embodiment). Accordingly, the stitch A_1 of the unit on the right side and the stitch Z_1 of the unit on the left side are brought closer in the direction of approaching each other in the knitting width direction to form the projecting knitted structure raised in a projecting form in the thickness direction of the knitted fabric.

[0011] According to another aspect of the knitting method of the knitted fabric of the present invention, a knitting yarn for knitting the stitch A_1 and the stitch P_1 and a knitting yarn for knitting the stitch Z_1 and the stitch P_2 are different types of knitting yarns. Of course, the knitting yarn for knitting the stitch A_1 and the stitch P_1 and the knitting yarn for knitting the stitch Z_1 and the stitch P_2 may be the same type of knitting yarns.

[0012] According to another aspect of the knitting method of the knitted fabric of the present invention, the projecting knitted structure is formed over the entire surface of the knitted fabric.

[0013] A knitted fabric of the present invention is a knitted fabric knitted using a flat knitting machine including at least a pair of a front and a back needle bed, and in which one of the front and back needle beds is capable of being racked in a traverse direction, the knitted fabric including a projecting knitted structure formed by bringing a left side stitch and a right side stitch adjacent in a knitting width direction closer in a direction of approaching each other in the knitting width direction. The left side stitch is rotated in a clockwise direction with a wale direction as an axis by having two cross-over yarns that are different in length and extending from the left side stitch and connecting to the stitches arranged on a back side of the knitted fabric. The right side stitch is rotated in a counterclockwise direction with the wale direction as an axis by having two cross-over yarns that are different in length and extending from the right side stitch and connecting to the stitches arranged on the back side of the knitted fabric. The left side stitch and the right side stitch lean against each other in a back to back state, and a portion on a boundary side of the left side stitch and the right side stitch in the projecting knitted structure projects out toward a surface side of the knitted fabric

[0014] According to the knitting method of the knitted fabric of the present invention, the knitted fabric of the present invention including the projecting knitted structure formed by bringing the stitch A_1 and the stitch Z_1 closer in a direction of approaching each other to project out to the surface of the knitted fabric can be knitted. In the projecting knitted structure, the appearance of when the knitted fabric is viewed from the left side and the appearance of when the knitted fabric is viewed from the right side can be differed by having the knitting yarn configuring the stitch A_1 and the knitting yarn configuring the stitch Z_1 as different types of knitting yarns (e.g., knitting yarn of different color, knitting yarn of different material, knitting yarn of different thickness).

[0015] While the projecting knitted structure is invented in an aim of changing the appearance of when viewed from the left side of the knitted fabric and the appearance of when viewed from the right side of the knitted fabric, it also has a knitted structure having a novel structure that has not been proposed in the past. Thus, even if the type of the knitting yarn of the stitch A_1 and the type of the knitting yarn of the stitch Z_1 configuring the projecting knitted structure are not different, the projecting knitted structure has a visual effect on the basis of such novel structure.

[0016] In the knitting method of the knitted fabric of the present invention, the projecting knitted structure is formed over the entire surface of the knitted fabric to apply the effect of the projecting knitted structure over the entire surface of the knitted fabric. In particular, the iridescent colored knitted fabric in which the hue changes depending on the viewing angle can be knitted by using different colors between the knitting yarn of the stitch A_1 and the knitting yarn of the stitch Z_1 configuring the projecting knitted structure.

[0017] When the stitch Q_0 exists at the start of the step α , and the step β and the stitch P_2 is newly knitted following the stitch Q_0 in the step β , a thick projecting knitted structure can be obtained compared to when the stitch Q_0 is not used. On the contrary, if the stitch Q_0 is not used, the number of stitches in the knitting width direction on the back side of the knitted fabric (side opposite to the side in which the projecting knitted structure projects out) is few compared to when the stitch Q_0 is used, and hence a thin projecting knitted structure can be obtained.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018]

Fig. 1(A) is a photograph of a knitted fabric shown in an embodiment seen from a left side;
 Fig. 1(B) is a photograph of the knitted fabric seen from a right side;
 Fig. 2 is an enlarged photograph of a projecting knitted structure arranged in the knitted fabric of Fig. 1;
 Fig. 3 is a knitting step diagram schematically showing a knitting procedure of a projecting knitted structure shown in a first embodiment;
 Fig. 4 is a simple loop diagram of the projecting knitted structure knitted in the first embodiment;
 Fig. 5 is a knitting step diagram schematically showing a knitting procedure of a projecting knitted structure shown in a

second embodiment; and

[0019] Fig. 6 is a simple loop diagram of the projecting knitted structure knitted in the second embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0020] An embodiment of a knitting method of a knitted fabric of the present invention will be hereinafter described based on the drawings. In the embodiment, a knitting example using a two-bed flat knitting machine including a front needle bed (hereinafter referred to as "FB") and a back needle bed (hereinafter referred to as "BB") extending in a traverse direction and disposed opposite to each other in a cross direction, and in which the BB can be racked in the traverse direction will be described. The flat knitting machine to be used is not, of course, limited to the two-bed flat knitting machine, and may be a four-bed flat knitting machine.

<First embodiment>

[0021] In the first embodiment, an example of knitting a knitted fabric in which alphabets stand out when the knitted fabric is seen from the left side as shown in Fig. 1(A) and in which numbers stand out when the knitted fabric is seen from the right side as shown in Fig. 1(B)

will be described. In order to obtain such a knitted fabric, a special knitted structure needs to be formed on the surface of the knitted fabric.

[0022] As shown in an enlarged photograph of Fig. 2, a projecting knitted structure 1 formed by bringing two adjacent stitches (left side stitch 2, right side stitch 3) closer in a direction of approaching each other is continuously arranged in plurals in a wale direction and a course direction of the knitted fabric on the surface of the knitted fabric of Fig. 1. The left side stitch 2 of the projecting knitted structure 1 contacts with the right side stitch 3 of the projecting knitted structure 1 in a state of the left side stitch 2 rotating in a clockwise direction with a wale direction as an axis and the right side stitch 3 rotating in a counterclockwise direction with the wale direction as an axis, so that a portion on a boundary side of the stitches 2, 3 projects out at the surface of the knitted fabric. Looking at a cross-section of the projecting knitted structure 1, the projecting knitted structure 1 is raised in a substantially triangular shape to the surface side of the knitted fabric. Thus, the left side stitch 2 can be seen more than the right side stitch 3 when the projecting knitted structure 1 is seen from the left side, while the right side stitch 3 can be seen more than the left side stitch 2 when the projecting knitted structure 1 is seen from the right side. That is, a knitted fabric in which the pattern that can be recognized differs in the right and left sides as shown in Fig. 1 can be knitted by partially changing the color of the left side stitch 2 and the color of the right side stitch 3 in the knitted fabric.

[0023] A knitting procedure of the projecting knitted structure 1 will now be described based on a knitting step diagram of Fig. 3. "Alphabet + number" in Fig. 3 indicates the number of the knitting step, a horizontal bar indicates a front needle bed (hereinafter referred to as "FB") and a back needle bed (hereinafter referred to as "BB"), ○ indicates a stitch held on the FB and the BB, and ● indicates a newly formed stitch. The illustration of a knitting needle arranged in the needle bed is omitted.

[0024] S1 of Fig. 3 shows a state in which the stitch A_0 and the stitch Z_0 are held in order toward the right side on the FB, and the stitch P_0 is held between the stitch A_0 and the stitch Z_0 in the BB. In S1, three units, each unit having the stitches A_0 , Z_0 , P_0 as one unit, are lined in a knitting width direction in a plane of drawing.

[0025] In S2, the BB is racked in the traverse direction to obtain a state in which the stitch P_0 is positioned on the left side of the stitch A_0 (correspond to the first half of the step α). Furthermore, in S2, knitting of a new stitch A_1 following the stitch A_0 and knitting of a new stitch P_1 following the stitch P_0 are continuously carried out (correspond to the second half of the step α). According to S2, the stitch A_1 is knitted continuously in the wale direction of the stitch A_0 , and the stitch P_1 is knitted continuously in the wale direction of the stitch P_0 . In this case, a moving direction of a yarn feeder for supplying the knitting yarn to the FB and the BB is not limited. For example, when performing S2, the yarn feeder is moved toward

the right side (left side) if the yarn feeder is on the left side (right side) of the stitch A_0 and the stitch P_0 to knit the stitch P_1 (stitch A_1), and then the stitch A_1 (stitch P_1) is knitted following thereto. The stitch P_1 may be a tuck stitch. If the stitch P_1 is a tuck stitch, knitting is performed on the stitch P_1 with a knitting yarn different from the knitting yarn of the tuck stitch to fix the tuck stitch before the next tuck knitting.

[0026] In S3, the BB is racked toward the right side, so that the stitch P_1 is positioned on the right side of the stitch Z_0 (correspond to the first half of the step β). Furthermore, in S3, the knitting of a new stitch Z_1 following the stitch Z_0 and the knitting of a new stitch P_2 following the stitch P_1 are continuously carried out (correspond to the second half of the step β). According to S3, the stitch P_2 is knitted continuously in the wale direction of the stitch P_1 , and the stitch Z_1 is knitted continuously in the wale direction of the stitch Z_0 . The moving direction of the yarn feeder in the step β is not limited. The moving direction of the yarn feeder in S3 is determined merely by whether the yarn feeder is on the left side or the right side of the stitch P_1 and the stitch Z_0 when performing S3. The stitch P_2 may be a tuck stitch. If the stitch P_2 is a tuck stitch, knitting is performed on the relevant tuck stitch before the next tuck knitting to fix the tuck stitch.

[0027] S2 and S3 are thereafter repeated to form the next projecting knitted structure in the wale direction of the projecting knitted structure. In the process of shifting from n th (n is a natural number greater than or equal to 1) S3 to $n+1$ th S2, the arrangement of the stitches A_1 , Z_1 , P_2 in S3 becomes the same state as the stitches A_0 , Z_0 , P_0 in S1 (see S3'). That is, the n th stitches A_1 , Z_1 , P_2 can be assumed as the $n+1$ th stitches A_0 , Z_0 , P_0 .

[0028] In what state the stitches A_1 , Z_1 , P_2 formed in S3 are actually in the knitted fabric will be described based on Fig. 4. Fig. 4 is a loop diagram simply showing the state of stitches in the cross-section of the knitted fabric. In Fig. 4, the stitches are shown in a deformed manner so that a deformed state of the stitches and the connection of the cross-over yarns between the stitches can be recognized, and the vertical relationship of the knitting yarn is ignored.

[0029] As shown in Fig. 4, the stitch A_1 of one unit is connected to the stitch P_1 of the same unit and the stitch P_1 of another unit adjacent on the right in the drawing with cross-over yarns, where the former cross-over yarn is shorter than the latter cross-over yarn. As a result, the stitch A_1 is rotated in the clockwise direction with the wale direction as the axis to get closer to the stitch Z_1 . The stitch Z_1 of one unit is connected to the stitch P_2 of the same unit and the stitch P_2 of another unit adjacent on the left in the drawing with cross-over yarns, where the former cross-over yarn is shorter than the latter cross-over yarn. As a result, the stitch Z_1 is rotated in the counterclockwise direction with the wale direction as the axis to get closer to the stitch A_1 . The stitch A_1 (the left side stitch 2) and the stitch Z_1 (the right side stitch 3) rotate in opposite directions to each other, and thus lean against

each other in a back to back state. As a result, the projecting knitted structure 1 configured by the stitches A_1 , Z_1 projects out to the surface side of the knitted fabric.

[0030] When repeating the knitting steps described above, the knitted fabric shown in Fig. 1 can be knitted by changing the colors between the knitting yarn for knitting the stitch A_1 and the stitch P_1 and the knitting yarn for knitting the stitch Z_1 and the stitch P_2 when forming the pattern in the knitted fabric. As apparent from Figs. 1(A) and 1(B), the appearance of the knitted fabric changes depending on the viewing angle. Furthermore, the knitted fabric has a line-shaped bump lined in the wale direction of the knitted fabric, and thus has a unique appearance based on the bump. The projecting knitted structure 1 is knitted using the front and back needle beds and is projected out to the surface side of the knitted fabric, and thus the knitted fabric of the present embodiment is thick but has high flexibility considering the thickness.

<Second Embodiment>

[0031] In the second embodiment, the arrangement state of the stitches before performing the step α and the step β differs from the first embodiment, and the knitting procedure of the knitted fabric in which the step β is performed before the step α will be described based on Fig. 5. The way of viewing Fig. 5 is the same as the way of viewing Fig. 3.

[0032] T1 shows a state in which the stitch A_0 and the stitch Z_0 are held on the FB, and the stitch P_0 and the stitch Q_0 are held on the BB. The stitch Q_0 of the BB is arranged on the right side of the stitch P_0 and on the left side of the stitch Z_0 in the knitting width direction. In T1, two units, each unit having the stitches A_0 , Z_0 , P_0 , Q_0 as one unit, are lined in the knitting width direction in the drawing.

[0033] In T2, the BB is racked toward the right side so that the stitch Q_0 is positioned on the right side of the stitch Z_0 , and the stitch Z_1 continuing in the wale direction of the stitch Z_0 and the stitch P_2 continuing in the wale direction of the stitch Q_0 are continuously knitted (correspond to the step β). The stitch P_2 may be a tuck stitch.

[0034] In T3, the BB is racked toward the left side so that the stitch P_0 is positioned on the left side of the stitch A_0 , and the stitch A_1 continuing in the wale direction of the stitch A_0 and the stitch P_1 continuing in the wale direction of the stitch P_0 are continuously knitted (correspond to the step α). The stitch P_1 may be a tuck stitch.

[0035] T2 and T3 are thereafter repeated to form the next projecting knitted structure following in the wale direction of the projecting knitted structure. In the process of shifting from the n th T3 to the $n+1$ th T2, the arrangement of the stitches A_1 , Z_1 , P_1 , P_2 in T3 becomes the same state as the stitches A_0 , Z_0 , P_0 , Q_0 in T1 (see T3'). That is, the n th stitches A_1 , Z_1 , P_1 , P_2 can be assumed as the $n+1$ th stitches A_0 , Z_0 , P_0 , Q_0 .

[0036] In what state the stitches A_1 , Z_1 , P_1 , P_2 formed

in T3 actually are in the knitted fabric will be described based on Fig. 6. The way of viewing Fig. 6 is the same as the way of viewing Fig. 4.

[0037] As shown in Fig. 6, the stitch A_1 in a unit on the right side of the drawing is connected to the stitch P_1 of the same unit and the stitch P_1 of another unit adjacent on the left side of the drawing with cross-over yarns, where the former cross-over yarn is shorter than the latter cross-over yarn. As a result, the stitch A_1 of the unit on the right side is rotated in the counterclockwise direction with the wale direction as the axis to get closer to the stitch Z_1 of the unit on the left side. The stitch Z_1 of one unit on the left side of the drawing is connected with the stitch P_2 of the same unit and the stitch P_2 of another unit adjacent on the right side of the drawing with cross-over yarns, where the former cross-over yarn is shorter than the latter cross-over yarn. As a result, the stitch Z_1 is rotated in the clockwise direction with the wale direction as the axis to get closer to the stitch A_1 of the unit on the right side. The stitch Z_1 (left side stitch 2) and the stitch A_1 (right side stitch 3) rotate in opposite directions to each other, and thus lean against each other in a back to back state. As a result, the projecting knitted structure 1 configured by the stitches A_1 , Z_1 projects out to the surface side of the knitted fabric.

[0038] According to the knitting steps described above, a knitted fabric more stable than the knitted fabric knitted with the knitting steps of the first embodiment is obtained. This is because the number of stitches in the knitting width direction on the back side of the knitted fabric of the second embodiment is greater than that of the first embodiment.

[0039] A novel jacquard pattern that appears and disappears depending on the viewing angle as shown in Fig. 1 can be formed as a visual pattern by partially changing the colors and materials of the knitting yarns.

<Third Embodiment>

[0040] The color of the knitting yarn for knitting the left side stitch 2 and the color of the knitting yarn for knitting the right side stitch 3 in Fig. 2 may be different over the entire knitted fabric. For example, by knitting the knitted fabric with a red knitting yarn for the left side stitch 2 and with a green knitting yarn for the right side stitch 3, a knitted fabric in which color gradation forms at a portion (a portion which is wrinkled, slacked, or curved along the human body) that curves when the knitted fabric is worn can be obtained. The gradation forms because the proportion the left side stitch 2 and the right side stitch 3 can be seen gradually changes according to the degree of curve of the knitted fabric. Such knitted fabric is an iridescent colored knitted fabric in which the hue partially changes in a complex manner depending on the extent of wrinkles and slacks when worn.

[0041] The positions of the stitches were changed only using the racking of the needle bed in the first to third embodiments, but the positions of the stitches may be

changed using the racking of the needle bed and the transferring of stitches.

5 Claims

1. A knitting method for knitting a knitted fabric using a flat knitting machine including at least a pair of a front and a back needle bed (FB, BB) and in which one of the front and back needle beds (FB, BB) is capable of being racked in a traverse direction, from a state (S1) in which a first stitch (A0) and a second stitch (Z0) are held in order toward a right side on one needle bed and a third stitch (P0) is held at a position between the first stitch (A0) and the second stitch (Z0) on the other needle bed, the knitting method of the knitted fabric **characterized by**,
a step α of obtaining a state (S2) in which a position of the third stitch (P0) is on a left side of the first stitch (A0) and continuously performing knitting of a new first stitch (A1) following the first stitch (A0) and knitting of a new third stitch (P1) following the third stitch (P0); and a step β of obtaining a state (S3) in which a position of the stitch P_1 is on a right side of the second stitch (Z0) and continuously performing knitting of a new second stitch (Z1) following the second stitch (Z0) and knitting of a next new third stitch (P2) following the new third stitch (P1),
the steps α and β being performed to bring the new first stitch (A1) and the new second stitch (Z1) closer in a direction of approaching each other in a knitting width direction to form a projecting knitted structure (1) raised in a projecting form in a thickness direction of the knitted fabric,
wherein the step α and the step β are interchangeable, and when performing the step β first, the new third stitch (P1) and the next new third stitch (P2) in the step β are replaced with the third stitch (P0) and the new third stitch (P1), and the third stitch (P0) and the new third stitch (P1) in the step α are replaced with the new third stitch (P1) and the next new third stitch (P2).
2. A knitting method for knitting a knitted fabric using a flat knitting machine including at least a pair of a front and a back needle bed (FB, BB) and in which one of the front and back needle beds (FB, BB) is capable of being racked in a traverse direction, from a state (T1) in which two or more units, each unit having a first stitch (A0) and a second stitch (Z0) held in order toward a right side on one needle bed, a third stitch (P0) held at a position between the first stitch (A0) and the second stitch (Z0) on the other needle bed and a fourth stitch (Q0) held at a position on a right side of the third stitch (P0) and on a left side of the second stitch (Z0) on the other bed as one unit, are lined in a knitting width direction, the knitting method of the knitted fabric **characterized by**,

a step α of obtaining a state (T3) in which a position of the third stitch (P0) is on a left side of the first stitch (A0) and continuously performing knitting of a new first stitch (A1) following the first stitch (A0) and knitting of a new third stitch (P1) following the third stitch (P0) ; and

a step β of obtaining a state (T2) in which a position of the fourth stitch (Q0) is on a right side of the second stitch (Z0) and continuously performing knitting of a new second stitch (Z1) following the second stitch (Z0) and knitting of a next new third stitch (P2) following the fourth stitch (Q0), the steps α and β being performed so that the new first stitch (A1) of the unit on the right side and the new second stitch (Z1) of the unit on the left side are brought closer in a direction of approaching each other in the knitting width direction to form a projecting knitted structure (1) raised in a projecting form in a thickness direction of the knitted fabric.

3. The knitting method of the knitted fabric according to claim 1 or 2, **characterized in that** a knitting yarn for knitting the new first stitch (A1) and the new third stitch (P1) and a knitting yarn for knitting the new second stitch (Z1) and the next new third stitch (P2) are different types of knitting yarns.
4. The knitting method of the knitted fabric according to any one of claims 1 to 3, **characterized in that** the projecting knitted structure (1) is formed over an entire surface of the knitted fabric.
5. A knitted fabric knitted using a flat knitting machine including at least a pair of a front and a back needle bed (FB, BB), and in which one of the front and back needle beds (FB, BB) is capable of being racked in a traverse direction, the knitted fabric **characterized by**

a projecting knitted structure (1) formed by bringing a left side stitch (2) and a right side stitch (3) adjacent in a knitting width direction closer in a direction of approaching each other in a knitting width direction, wherein

the left side stitch (2) is rotated in a clockwise direction with a wale direction as an axis by having two cross-over yarns that are different in length and extending from the left side stitch (2) and connecting to the stitches arranged on a back side of the knitted fabric;

the right side stitch (3) is rotated in a counterclockwise direction with the wale direction as an axis by having two cross-over yarns that are different in length and extending from the right side stitch (3) and connecting to the stitches arranged on the back side of the knitted fabric; and

the left side stitch (2) and the right side stitch (3) lean against each other in a back to back state, and a portion on a boundary side of the left side stitch (2)

and the right side stitch (3) in the projecting knitted structure (1) projects out toward a surface side of the knitted fabric.

Patentansprüche

1. Strickverfahren zum Stricken eines Gestricks unter Verwendung einer Flachstrickmaschine mit wenigstens einem Paar von vorderen und hinteren Nadelbetten (FB, BB), und in der eines der vorderen und hinteren Nadelbetten (FB, BB) in einer Querrichtung aus einem Zustand (S1) versetzt werden kann, in dem eine erste Masche (A0) und eine zweite Masche (Z0) in einer Reihenfolge zu einer rechten Seite hin an einem Nadelbett gehalten werden, und eine dritte Masche (P0) an einer Position zwischen der ersten Masche (A0) und der zweiten Masche (Z0) an dem anderen Nadelbett gehalten wird, wobei das Strickverfahren zum Stricken eines Gestricks **gekennzeichnet ist durch:**

einen Schritt α zum Erhalten eines Zustands (S2), in dem eine Position der dritten Masche (P0) links von der ersten Masche (A0) ist, und zum kontinuierlichen Durchführen eines Strickens einer neuen ersten Masche (A1) auf die erste Masche (A0) folgend und eines Strickens einer neuen dritten Masche (P1) auf die dritte Masche (P0) folgend, und

einen Schritt β zum Erhalten eines Zustands (S3), in dem die Position der Masche (P1) rechts von der zweiten Masche (Z0) ist, und zum kontinuierlichen Durchführen eines Strickens einer neuen zweiten Masche (Z1) auf die zweite Masche (Z0) folgend und eines Strickens einer nächsten neuen dritten Masche (P2) auf die neue dritte Masche (P1) folgend,

wobei die Schritte α und β durchgeführt werden, um die neue erste Masche (A1) und die neue zweite Masche (Z1) näher in einer sich aneinander annähernden Richtung in einer Strickbreitenrichtung zu bringen, um eine vorstehende Strickstruktur (1) zu bilden, die sich vorstehend in einer Dickenrichtung des Gestricks erhebt, wobei der Schritt α und der Schritt β austauschbar sind, und wenn der Schritt β zuerst durchgeführt wird, die neue dritte Masche (P1) und die nächste neue dritte Masche (P2) in dem Schritt β **durch** die dritte Masche (P0) und die neue dritte Masche (P1) ersetzt werden und die dritte Masche (P0) und die neue dritte Masche (P1) in dem Schritt α **durch** die neue dritte Masche (P1) und die nächste neue dritte Masche (P2) ersetzt werden.

2. Strickverfahren zum Stricken eines Gestricks unter Verwendung einer Flachstrickmaschine mit wenig-

tens einem Paar von vorderen und hinteren Nadelbetten (FB, BB), und in der eines der vorderen und hinteren Nadelbetten (FB, BB) in einer Querrichtung aus einem Zustand (T1) versetzt werden kann, in dem zwei oder mehr Einheiten in einer Strickbreitenrichtung aufgereiht sind, wobei jede Einheit eine erste Masche (A0) und eine zweite Masche (Z0), die in einer Reihenfolge zu einer rechten Seite an einem Nadelbett gehalten werden, eine dritte Masche (P0), die an einer Position zwischen der ersten Masche (A0) und der zweiten Masche (Z0) an dem anderen Nadelbett gehalten wird, und eine vierte Masche (Q0), die an einer Position rechts von der dritten Masche (P0) und links von der zweiten Masche (Z0) an dem anderen Nadelbett gehalten wird, aufweist, wobei das Strickverfahren zum Stricken eines Gestricks **gekennzeichnet ist durch:**

einen Schritt α zum Erhalten eines Zustands (T3), in dem die Position der dritten Masche (P0) links von der ersten Masche (A0) ist, und zum kontinuierlichen Durchführen eines Strickens einer neuen ersten Masche (A1) auf die erste Masche (A0) folgend und eines Strickens einer neuen dritten Masche (P1) auf die dritte Masche (P0) folgend, und
einen Schritt β zum Erhalten eines Zustands (T2), in dem die Position der vierten Masche (Q0) rechts von der zweiten Masche (Z0) ist, und zum kontinuierlichen Durchführen eines Strickens einer neuen zweiten Masche (Z1) auf die zweite Masche (Z0) folgend und eines Strickens einer nächsten neuen dritten Masche (P2) auf die vierte Masche (Q0) folgend, wobei die Schritte α und β derart durchgeführt werden, dass die neue erste Masche (A1) der Einheit auf der rechten Seite und die neue zweite Masche (Z1) der Einheit auf der linken Seite näher in einer sich aneinander annähernden Richtung in einer Strickbreitenrichtung gebracht werden, um eine vorstehende Strickstruktur (1) zu bilden, die sich vorstehend in einer Dickenrichtung des Gestricks erhebt.

3. Strickverfahren zum Stricken eines Gestricks nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** ein Strickfaden für das Stricken der neuen ersten Masche (A1) und der neuen dritten Masche (P1) und ein Strickfaden für das Stricken der neuen zweiten Masche (Z1) und der nächsten neuen dritten Masche (P2) verschiedene Typen von Strickfäden sind.
4. Strickverfahren zum Stricken eines Gestricks nach einem der Ansprüche 1 bis 3, **dadurch gekennzeichnet, dass** die vorstehende Strickstruktur (1) über die gesamte Fläche des Gestricks hinweg gebildet wird.

5. Gestrick, das unter Verwendung einer Flachstrickmaschine mit wenigstens einem Paar von vorderen und hinteren Nadelbetten (FB, BB) und in der eines der vorderen und hinteren Nadelbetten (FB, BB) in einer Querrichtung versetzt werden kann, gestrickt wird, wobei das Gestrick **gekennzeichnet ist durch:**

eine vorstehende Strickstruktur (1), die gebildet wird, indem eine linke Masche (2) und eine dazu in einer Strickbreitenrichtung benachbarte rechte Masche (3) näher in einer sich aneinander annähernden Richtung in einer Strickbreitenrichtung gebracht werden, wobei:

die linke Masche (2) in einer Richtung im Uhrzeigersinn mit einer Maschenstäbchenrichtung als einer Achse gedreht wird, indem zwei Überkreuzungsfäden, die verschiedene Längen aufweisen und sich von der linken Masche (2) erstrecken, verwendet werden, und die Maschen auf der Rückseite des Gestricks verbunden werden, die rechte Masche (3) in der Richtung gegen den Uhrzeigersinn mit der Maschenstäbchenrichtung als einer Achse gedreht wird, indem zwei Überkreuzungsfäden, die verschiedene Längen aufweisen und sich von der rechten Masche (3) aus erstrecken, verwendet werden, und die Maschen auf der Rückseite des Gestricks verbunden werden, und
die linke Masche (2) und die rechte Masche (3) Rücken an Rücken aneinander anlehnen, und
ein Teil auf einer Grenzseite der linken Masche (2) und der rechten Masche (3) in der vorstehenden Strickstruktur (1) nach außen zu der Seite der Oberfläche des Gestricks hin vorsteht.

Revendications

1. Procédé de tricotage pour tricoter un tissu tricoté en utilisant une machine à tricoter à plat comprenant au moins deux fontures, une fonture avant et une fonture arrière (FB, BB), et dans laquelle l'une des fontures avant et arrière (FB, BB) peut être déplacée dans une direction transversale, à partir d'un état (S1) dans lequel une première maille (A0) et une deuxième maille (Z0) sont maintenues dans l'ordre vers un côté droit sur une première fonture et une troisième maille (P0) est maintenue à une position entre la première maille (A0) et la deuxième maille (Z0) sur l'autre fonture, le procédé de tricotage du tissu tricoté étant **caractérisé par**,

- une étape α consistant à obtenir un état (S2) dans lequel la position de la troisième maille (P0) est sur un côté gauche de la première maille (A0) et à réaliser de façon continue un tricotage d'une nouvelle première maille (A1) à la suite de la première maille (A0) et un tricotage d'une nouvelle troisième maille (P1) à la suite de la troisième maille (P0) ; et
- une étape β consistant à obtenir un état (S3) dans lequel la position de la maille P₁ est sur le côté droit de la deuxième maille (Z0) et à réaliser de façon continue un tricotage d'une nouvelle deuxième maille (Z1) à la suite de la deuxième maille (Z0) et un tricotage d'une nouvelle troisième maille suivante (P2) à la suite de la nouvelle troisième maille (P1), les étapes α et β étant réalisées pour amener la nouvelle première maille (A1) et la nouvelle deuxième maille (Z1) plus proches dans une direction de rapprochement entre elles dans la direction de largeur de tricotage pour former une structure tricotée saillante (1) dressée sous forme de protubérance dans la direction de l'épaisseur du tissu tricoté, dans lequel l'étape α et l'étape β sont interchangeables, et lors de la réalisation de l'étape β en premier, la nouvelle troisième maille (P1) et la nouvelle troisième maille suivante (P2) dans l'étape β sont remplacées par la troisième maille (P0) et la nouvelle troisième maille (P1), et la troisième maille (P0) et la nouvelle troisième maille (P1) dans l'étape α sont remplacées par la nouvelle troisième maille (P1) et la nouvelle troisième maille suivante (P2).
2. Procédé pour tricoter un tissu tricoté en utilisant une machine à tricoter à plat comprenant au moins deux fontures, une fonture avant et une fonture arrière (FB, BB), et dans laquelle l'une des fontures avant et arrière (FB, BB) peut être déplacée dans une direction transversale, à partir d'un état (T1) dans lequel deux ou plusieurs blocs, chaque bloc comportant une première maille (A0) et une deuxième maille (Z0) maintenues dans l'ordre vers un côté droit sur une première fonture, une troisième maille (P0) maintenue à une position entre la première maille (A0) et la deuxième maille (Z0) sur l'autre fonture et une quatrième maille (Q0) maintenue à une position sur le côté droit de la troisième maille (P0) et sur le côté gauche de la deuxième maille (Z0) sur l'autre fonture sous forme d'un seul bloc, sont alignés dans une direction de largeur de tricotage, le procédé de tricotage du tissu tricoté étant **caractérisé par**, une étape α consistant à obtenir un état (T3) dans lequel la position de la troisième maille (P0) est sur le côté gauche de la première maille (A0) et à réaliser de façon continue un tricotage d'une nouvelle première maille (A1) à la suite de la première maille (A0) et un tricotage d'une nouvelle troisième maille (P1) à la suite de la troisième maille (P0) ; et une étape β consistant à obtenir un état (T2) dans lequel la position de la quatrième maille (Q0) est sur un côté droit de la deuxième maille (Z0) et à réaliser de façon continue un tricotage d'une nouvelle deuxième maille (Z1) à la suite de la deuxième maille (Z0) et un tricotage d'une nouvelle troisième maille suivante (P2) à la suite de la quatrième maille (Q0), les étapes α et β étant réalisées de telle sorte que la nouvelle première maille (A1) du bloc sur le côté droit de la nouvelle deuxième maille (Z1) du bloc sur le côté gauche sont amenées plus proches dans une direction de rapprochement entre elles dans la direction de largeur de tricotage pour former une structure tricotée saillante (1) dressée sous forme d'une protubérance dans la direction de l'épaisseur du tissu tricoté.
 3. Procédé de tricotage du tissu tricoté selon la revendication 1 ou 2, **caractérisé en ce qu'un** fil à tricoter pour tricoter la nouvelle première maille (A1) et la nouvelle troisième maille (P1) et un fil à tricoter pour tricoter la nouvelle deuxième maille (Z1) et la nouvelle troisième maille suivante (P2) sont des fils à tricoter de types différents.
 4. Procédé de tricotage du tissu tricoté selon l'une quelconque des revendications 1 à 3, **caractérisé en ce que** la structure tricotée saillante (1) est formée sur une surface complète du tissu tricoté.
 5. Tissu tricoté en utilisant une machine à tricoter à plat comprenant au moins deux fontures, une fonture avant et une arrière (FB, BB), et dans laquelle l'une des fontures avant et arrière (FB, BB) peut être déplacée dans une direction transversale, le tissu tricoté étant **caractérisé par** une structure tricotée saillante (1) formée en amenant une maille de côté gauche (2) et une maille de côté droit (3) adjacentes dans la direction de la largeur de tricotage plus proches dans d'une direction de rapprochement entre elles dans la direction de largeur de tricotage, dans lequel la maille du côté gauche (2) est tournée dans le sens horaire avec une direction de colonne de mailles comme axe grâce à deux fils croisés qui sont de longueurs différentes et qui s'étendent à partir de la maille du côté gauche (2) et se connectent aux mailles agencées sur un côté arrière du tissu tricoté ; la maille du côté droit (3) est tournée dans le sens antihoraire avec la direction de colonne de mailles comme axe grâce à deux fils croisés qui sont de longueurs différentes et qui s'étendent à partir de la maille du côté droit (3) et se connectent aux mailles agencées sur le côté arrière du tissu tricoté ; et la maille du côté gauche (2) et la maille du côté droit (3) s'appuient l'une contre l'autre dos à dos, et une portion sur un côté de frontière de la maille du côté gauche (2) et de la maille du côté droit (3) dans la structure tricotée saillante (1) est saillante en di-

rection d'un côté de surface du tissu tricoté.

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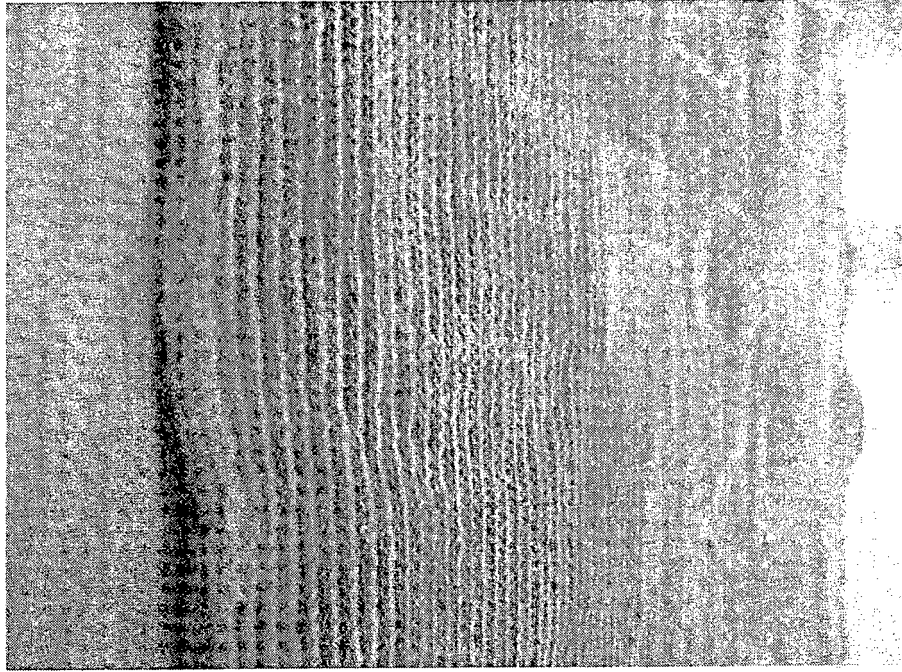
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Fig. 1

(A)



(B)

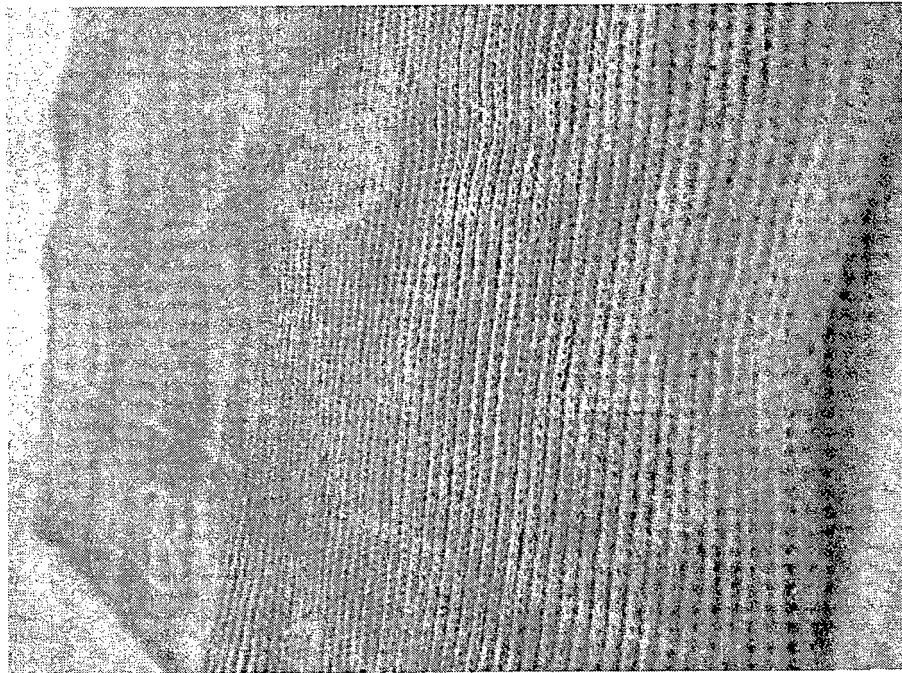


Fig. 2

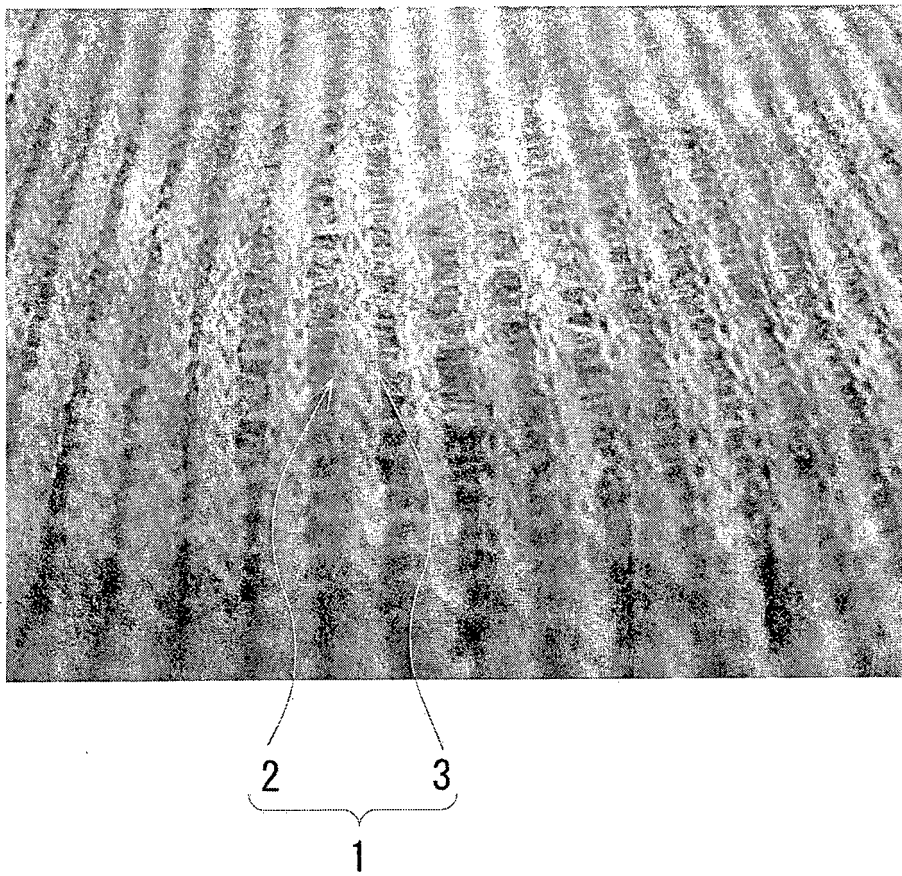


Fig. 3

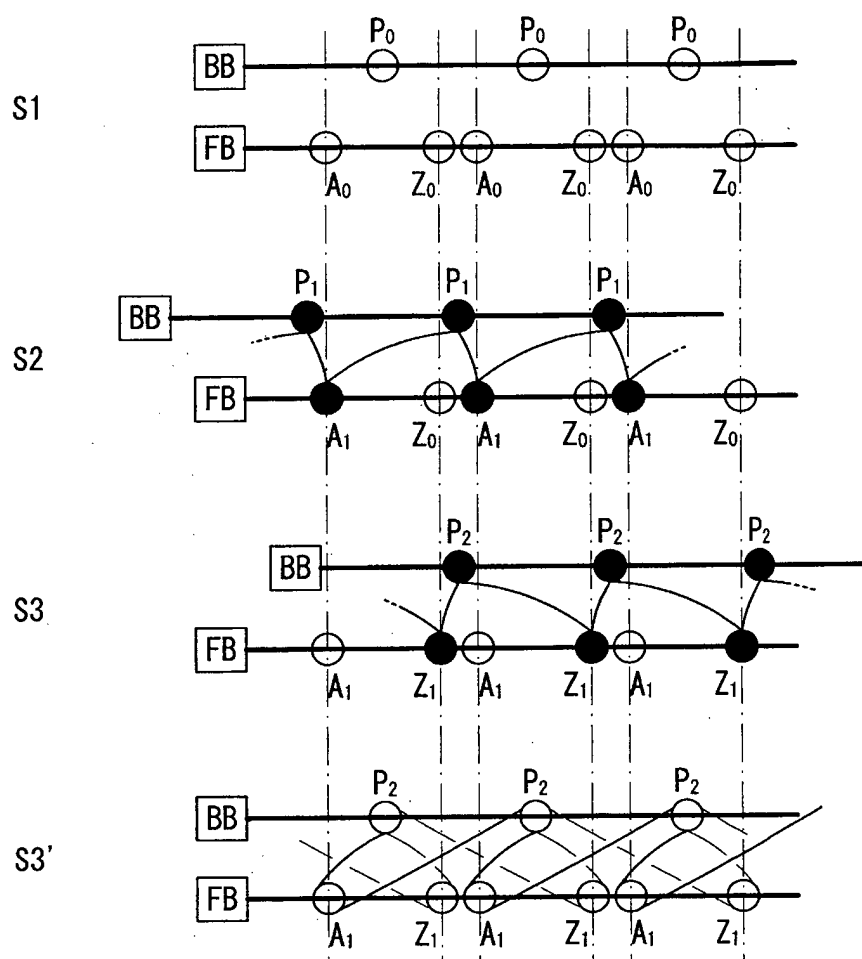


Fig. 4

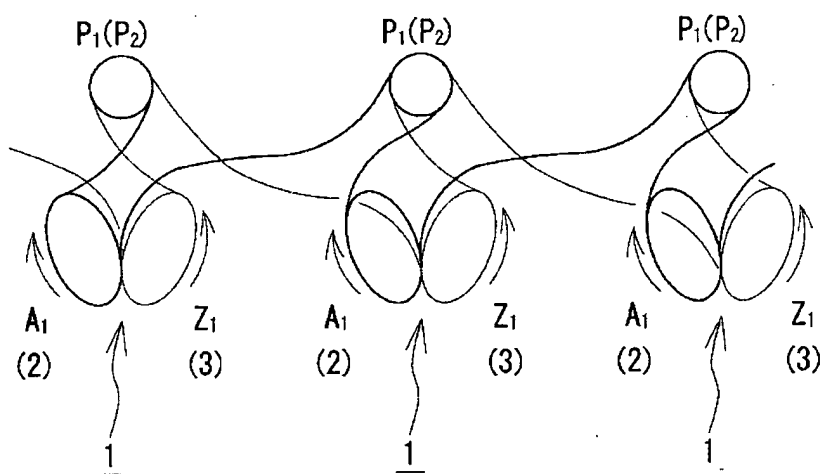


Fig. 5

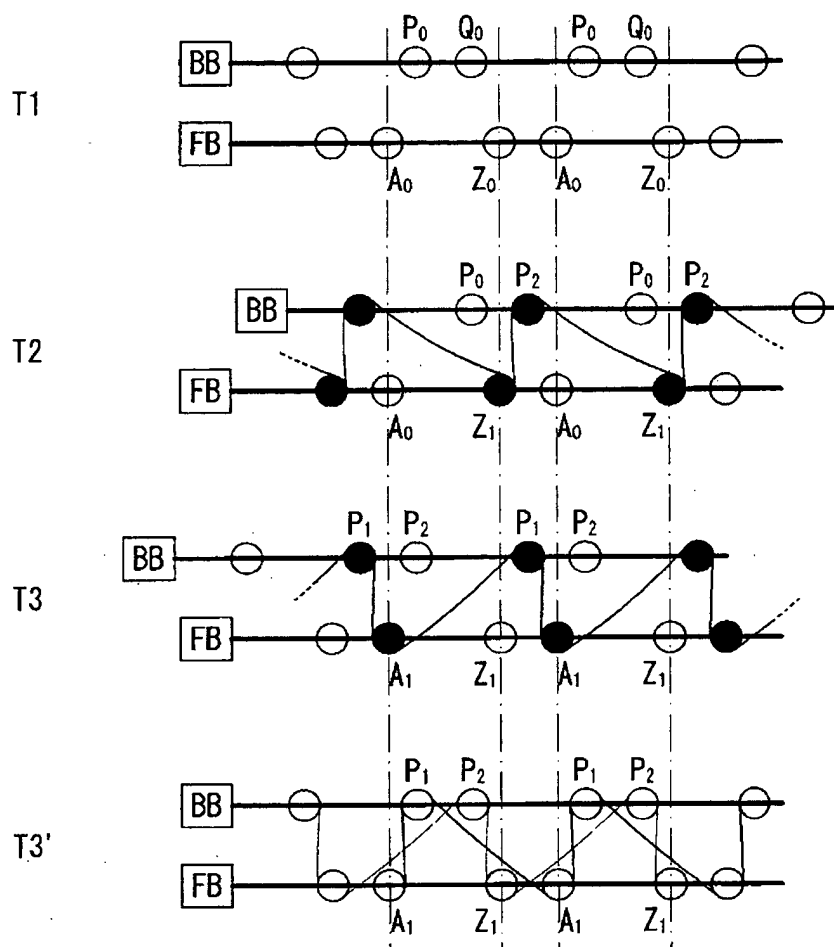
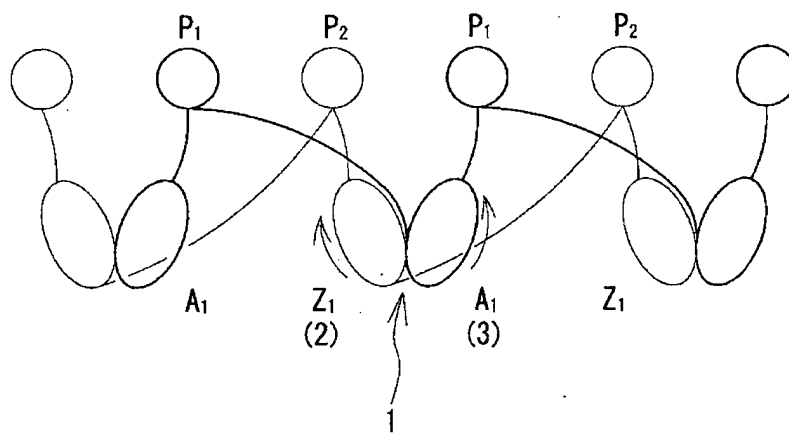


Fig. 6



REFERENCES CITED IN THE DESCRIPTION

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